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THE BUILDING AND USE OF OBJECTIVE TESTS
IN HIGH SCHOOL ECONOMICS

Submitted by

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B.B.A. 1932

In partial fulfillment of the
requirements of the degree of

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1. The teacher should be able to select the material to be taught.

2. The teacher should be able to select the method of teaching.

3. The teacher should be able to select the material to be taught.

4. The teacher should be able to select the method of teaching.

"In modern business every detail in the manufacture of an object is examined critically. Similarly the teacher should employ a critical examination to measure the results of his teaching."

E. R. Breslich

5. The teacher should be able to select the material to be taught.

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THE BUILDING AND USE OF OBJECTIVE TESTS IN HIGH SCHOOL ECONOMICS

Present Status of Testing in the High School

Growth of the Test Movement. What is frequently called the "test movement" had its beginnings about 1900. A few years prior to this date Dr. J. M. Rice "urged the measurement of school achievements by carefully prepared tests as a means of determining the merits of methods of instruction, courses of study, textbooks, etc." (1) Although Dr. Rice is generally credited with being the father of educational measurement, Horace Mann in 1845 formulated "a clean-cut concept of the written examination and its superiority over such older methods as the oral quiz." (2) He contended that the written examination was superior because:

1. It is impartial
2. It is just to the pupils
3. It is more thorough than older forms of examinations
4. It prevents the "officious interference" of the teacher

(1) Monroe, E. S. Written Examinations vs. Standardized Tests. School Review, Vol. 32, 1924, p. 254
(2) Ruch, G. M. The Objective or New-Type Examination Scott, Foresman & Co. 1929, p. 3

5. It determines beyond appeal or gainsaying, whether the pupils have been faithfully and competently taught
6. It takes away all possibility of favoritism
7. It makes the information obtained available to all
8. It enables all to appraise the ease or difficulty of the questions (1)

Although the examination which Horace Mann had in mind was what we now call the "traditional" or old-type examination, many of his points are being used today with reference to the new-type examination. Since the publication of his treatise in 1845 educators have argued for and against the written examination. Some have been in favor of abolishing them entirely on the grounds that the results are unfair to the students. "The physical and mental conditions of many students taking a mid-term or final test preclude determining their average accomplishment. Some happen to be below their usual health, some above; some are partially paralyzed with excitement, some roused to unwonted mental efficiency." (2)

Accepting the fact that the measurement of the abilities of students is necessary to a high degree of school efficiency; that, "The promotion of

(1) Ruch, G. M. op. cit. p. 4

(2) James, Benj. B. The Modern Test. School and Society, vol. 19, 1924, p. 213

pupils, the guidance of pupils, both educational and vocational, the supervision of instruction and even instruction itself, cannot be most efficient unless the abilities of the pupils are measured at intervals" (1)--those opposed to written examinations have endeavored to set up certain substitutes. They would base marks on teachers' estimates. This might be satisfactory for a small class if it were so conducted as to necessitate frequent oral work and if a careful record were kept of the quality of that work. In oral work, however, the pupil may make a good impression because of personal characteristics and because of the detailed questioning by the instructor, whereas other pupils who are good thinkers but who may be slow in their mental processes are at a disadvantage. Moreover, no question asked in the "recitation" can be truly representative of relative accomplishment because the teacher cannot know how well other students would have answered the same question. (2) In addition to this, grades which are assigned daily are necessarily based on a small amount of work and carry with them no recognition of ability to organize the content of a course or the retention of pertinent facts.

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- (1) Monroe, W. S. Written Examinations and Their Improvement. Historical Outlook, June 1923, p. 215
 (2) James, Benj. B. op. cit. p. 213

This fact is demonstrated in an experiment carried on by T. H. Schutte (1) in which two classes received the same instruction but one class was assured of no final examination and the other expected a final examination. Both classes were given the Otis Self-Administering Tests of Mental Ability at the beginning of the course so that the mental ability of the two groups might be compared. The range for the non-examination group was found to be from 35 to 66, and for the examination group from 33 to 70; the median for each group was 50, so that the two groups were practically equal in mental ability.

A special effort was made to give the same emphasis to the problems and questions in each division. The examination group was told frequently that certain points were important and would probably appear in the final examination, while the same points were called to the attention of the non-examination group with the reminder that the work should be mastered thoroughly from day to day as there would be no provision for final review. Brief quizzes and tests on the current material were given to each class during the course. The range of marks for these unannounced quizzes was closely parallel in the two groups but

(1) Schutte, T. H. Is There Value in the Final Examination? *Journal of Educational Research*. Vol. 12, 1925, p. 204

the examination group had a decidedly larger number who attained the higher grades than did the non-examination group.

At the end of the course both groups were given the same final examination. A sense of injustice was obviated by explaining to the non-examination group the nature of the experiment and by giving them the choice as to whether or not the score attained on the test should be included in making up the term marks. In order that the examination group might not have the advantage of cramming, particularly heavy assignments were made during the week before the examination and the group was told that it would be more beneficial for them to keep up their standard in daily work rather than to review. So far as it could be determined the average amount of time spent in study during the course was the same for each group.

The range of scores in the final examination was from 60 to 124 for the non-examination group and from 68 to 154 for the examination group with a much wider spread toward the higher scores in the latter group. Although both classes were of equal mental ability according to the Otis Test, there was a low correlation between mental ability and the scores attained on the final examination in the non-examina-

tion group, and a rather high correlation between these two factors in the examination group. From this fact the conclusion was drawn that the examination group made better use of their existing mental ability, that they learned with a more definite intention of retaining the material of the course than did the other group. This method of study produced a clearer and more lasting impression which was not only evident in the results of the final examination but in daily work. The knowledge that there will be a final examination, therefore, does produce worthwhile results.

James E. Russell in his Trend in American Education says, "Such tests as written recitations, quizzes, term and final examinations, and the like are of the greatest value to the teacher who is really concerned in the education of his pupils. The examinations are indispensable; they need no argument to justify the position they hold in our scheme of instructions." (1) And so we conclude with Monroe (2) that, "The written examination yields a type of achievement which cannot be secured through any other means," and focus our attention on the improvement of

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- (1) Weideman, C. C. How to Construct True-False Examinations. Columbia University Contribution to Education No. 225, 1926, p. 1
 - (2) Monroe, E. S. Written Examinations and Their Improvement. op. cit. p. 217

the written examination.

As has been stated, the real beginnings in the modern test movement so far as educators are concerned dates from the early 1900's. In 1904 Thorndike published his Introduction to the Theory of Mental and Social Measurements, the pioneer work in this field. Before this time the interest in tests was largely fostered by professors of psychology. (1) The most important factor in the large-scale development of group tests was the World War, when there was immediate need to segregate the thousands of men into the places for which they were best fitted. The tests used for such purposes were mental tests as distinguished from educational tests as we now know them. Mental tests attempt to determine native ability and the capacity for learning, whereas educational tests are used to measure the products of learning. Educational tests, however, were based upon the techniques of the mental tests, and the unscientific methods of examining began to give way to the modern standardized methods adapted from intelligence testing. (2) By 1915 a number of these new measuring instruments, standardized tests,

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- (1) Freeman, F. N. Mental Tests. Houghton Mifflin Co. 1926. p. 1
 (2) Kitson, H. D. Commercial Education in Secondary Schools. Ginn & Company, 1929. p. 330

were available for use and the educational public was beginning to be interested in them.

These standardized tests were an attempt to get away from the subjectivity of teachers' marks which is unavoidable in the traditional essay type test, and to so formulate questions that there is only one correct answer, thus making the marks assigned entirely objective. The need for improvement along this line is indicated by the studies of Starch and Elliott. (1) In 1912 and 1913 they published reports of three scientific investigations which demonstrated that different teachers of a given subject differed widely in the grade which they assigned to the same examination paper. For example, in the case of an examination paper in plane geometry it was shown that in a group of 116 teachers the grades assigned on a scale of 100% ranged from 28% to 92%. Such studies as these confirmed the belief that written examinations were very imperfect measuring instruments and that examination grades were very inaccurate.

In order that what is meant by the new-type test may be clearly understood, Odell's classification is here reviewed. (2) He divides objective tests into

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- (1) Monroe, W. S. Written Examinations vs. Standardized Tests. op. cit. pp. 253-254
(2) Odell, C. W. Educational Measurement in the High School. The Century Co. 1930, pp. 21-28

two groups, standardized tests and the new-type test. Standardized tests, as originally used, designated those objective tests which had been constructed along certain "scientific" lines and tried out in a sufficient number of cases so that the results expected, indicated by a norm, might be rather accurately gauged.

"Scientific" as used in this connection has not been clearly defined but it has been accepted as a badge of respectability. (1) The term "standard" as now used does not always indicate that the test has been tried out on large numbers of pupils but that it has been constructed along certain designated principles so that the pupil's responses are absolutely objective. The term is also today ordinarily applied to tests that are available commercially, that is, they may be obtained from a publisher.

The informal objective, or new-type, test is the name used for those tests which are constructed by the teacher for her own use. These are modeled on the standard test. They attempt to be highly objective and make use of the forms and methods of scoring of the standardized test but are built to fit a local need; they have not been tried out to test their validity, and they are not commercially available.

(1) Monroe, W. S. Written Examinations vs. Standardized Tests. op. cit. p. 255

Standardized tests are divided into intelligence tests and achievement tests. Intelligence tests seek to measure native as well as acquired intelligence. This measurement cannot include all phases of intelligence but an attempt is made to sample those abilities which are required for successful academic school work. Achievement tests, as the name implies, seek to measure a pupil's accomplishment in a given school subject. These are sometimes termed educational tests, but this term is considered too broad to be applied to any one type of test.

Achievement tests in turn may be divided into three kinds: General survey tests, diagnostic tests, and prognostic tests. The survey test may measure general accomplishment in one or many subjects. It quite often consists of a battery of tests including an intelligence test and several achievement tests. The term "diagnostic" test is technically used in a very narrow sense. It is applied to a strictly limited unit of a subject which is broken up into individual skills in an attempt to determine at what particular point the pupil's performance is at fault. An example of this type of test is the Rugg-Clark Algebra Test which analyzes the various processes in algebra. (1) Very few strictly diagnostic tests are

(1) Symonds, P. M. Measurement in Secondary Education.
The Macmillan Company 1927 p. 124

available and their detailed nature necessitates an examination of such length that it is impracticable for ordinary class room use. Prognostic tests differ from other types of tests in that instead of measuring results they attempt to predict outcomes in a particular subject or vocation. In a general way intelligence tests may be used as prognostic tests but more often the prognostic test attempts to analyze aptitudes for the abilities making up such subjects as mathematics, languages, or the trades.

Other classifications met with, such as individual and group, verbal and non-verbal, appear to be self explanatory.

The kinds of tests usually included in the new-type plan are known variously as the true-false, the yes-no, the multiple choice, the completion, and the matching or association types. In the true-false examination a statement is given which the pupil is to mark either as true or false; in the multiple choice type, at least four choices are given and the student is asked to indicate the one which will make the statement complete and true; the matching test consists of pairing a certain term with its proper definition; and the completion test consists of inserting the proper word in a blank in order to complete the statement. This very brief description is

given at this time in order that there may be no misunderstanding of the term, "informal objective tests." Examples of the kinds of tests mentioned may be found in Part V.

The modern test movement, however, made haste slowly. In 1924 Benjamin James says, "Comparatively few teachers have heard there is such a thing as a new form of test; * * * most of those who have heard of it have a vague idea that it is some freak of the psychology department of colleges. Very few have experimented with it and very few indeed have in a determined way set about adopting this time and worry saving device." (1)

Testing in commercial education. James's statement in 1924 regarding testing movement as a whole is still applicable to testing in the commercial subjects. While there are a relatively large number of tests in commercial subjects today, they "have been constructed by personnel workers, employment directors, and others whose chief interest is in the business world rather than in education." (2) The Thurston Clerical Examination, the Thurston Proficiency Tests for Typists, and the Cody Commercial Tests "are examples which

(1) James, Benj. B. op. cit. p. 209

(2) Odell, C. W. op. cit. p. 335

possess utility in business and industry but are not adequate for the needs of the commercial department of the modern high school." (1) This condition exists in spite of the fact that the commercial field involves a great number of aptitudes and skills such as English grammar, spelling, punctuation, and arithmetic, which can be measured indirectly by standard mental and educational tests.

If this situation is true in regard to the vocational subjects in the commercial curriculum, it is more especially true in the field of the social subjects which are coming to be considered of primary importance in commercial education today. This is due, perhaps, to the recognized difficulty of measuring achievement in the social subjects, in which we include economics. This need not be an insurmountable barrier, according to Ruth E. Hardy, who says, "You give students the regulation kind of question: 'Write a paragraph on ---' or 'Compare this and that' and you are asking them to remember something, to use good English expression, to analyze, to arrange and to form a judgment. In the newer types you at least attempt to find out one thing at a time about your student: Can he

(1) Ruch & Stoddard. Tests and Measurements in High School Instruction. Scott Foresman and Co. 1927 p. 187

remember? Quite a separate matter from: Can he use words correctly?" (1)

In discussing the measuring of results in social studies R. M. Tryon says that there have been three phases in the measuring movement. "Prior to 1915 the traditional essay examination reigned supreme. Scientific study of educational processes by means of standard tests first made itself felt in the direction of objectively determining the results actually achieved and the standard to be attained in such subjects as reading, spelling, writing, and arithmetic. For the past decade standard tests in these subjects have been the instrument used objectively to determine the kind of results demanded by the scientific movement in education which arose soon after 1900. To date, however, it seems that the idea of standard tests in history will probably have to be abandoned. The unstandardized, new-type tests which began to get serious consideration about three years ago are doing much to make the standard tests somewhat unnecessary adjuncts to the testing of achievement in the social studies." (2)

It is with this latest movement that we are here concerned.

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- (1) Hardy, Ruth E. New Types of Tests in Social Science. Historical Outlook, November 1923. p. 327
- (2) Tryon, R. M. Standardized and New-Type Tests in Social Studies. Historical Outlook, vol. 17, 1927 p. 172

Uses of Tests in the High School

To measure efficiency of teaching. "After a teacher has instructed his students to the best of his ability," according to Monroe, "some will have failed to learn; some will have learned certain details but neglected others, and a few may have mastered all of the assignment. It becomes necessary at some time for each teacher to check up the work of his students in order to know which students need supplementary or remedial instruction." (1) "It may be said that the principal value and aim of all testing should be to improve the quality of teaching by means of an analytical exposition of its problems and difficulties. This type of testing is fundamental in the progressive organization of a course." (2) "The instructor may very profitably do more than simply rate the examination paper. In the case of students receiving low marks their answers may be studied in order to ascertain in what way and why they have failed." (3)

"The emphasis which is being put on analyzing the results of tests is a feature of the testing

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- (1) Monroe, W. S. Written Examinations and Their Improvement. op. cit. p. 219
 - (2) Breslich, E. R. Testing as a Means of Improving the Teaching of High School Mathematics. Mathematics Teacher, XIV, May 1921, p. 276
 - (3) Monroe, W. S. Ibid. p. 219

movement that the * * teacher cannot afford to overlook. The whole technique of keeping records of class and individual achievements for later comparison, of tabulating scores and particular kinds of errors, is a valuable contribution toward improvement of instruction. The old type of examiner was interested in the score principally as it helped make up the term marks. The new type studies the test paper as a physician does the findings of his thermometer and stethoscope; then, having diagnosed, proceeds to modify instruction to remedy the weak places revealed." (1)

To measure progress in learning. P. L. Spencer (2) feels that home-made examinations can be made diagnostic both of class and individual weaknesses. His plan follows very closely the Morrison unit plan of setting up a unit of accomplishment; teaching the various principles involved; testing to measure the pupil's knowledge of the unit; remedial instruction; and re-testing. The usual type of examination stops with the scoring of the results, but this is where

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- (1) Elston, Bertha. Improving the Teaching of History Through the Use of Tests. Historical Outlook. Vol. 14, 1923. p. 304
 (2) Spencer, P. L. The Improvement of Teaching by Means of "Home-made" Non-standardized, Diagnostic Tests and Remedial Instruction. School Review, 1923, pp. 276-281

the diagnostic examination begins, according to Prof. Spencer. He is using diagnostic in its broad sense of showing failure to comprehend certain parts of the instruction, rather than in its more technically accepted meaning of the breaking down of units into individual parts to determine at exactly which point in a process the learner fails.

In considering the diagnostic value of tests James points out that the teacher's judgment of the relative difficulty of a certain question is unreliable; that teachers disagree among themselves as to difficulties. He says, "Deciding relative difficulty by the proportions of students failing to answer them is the only accepted way, * * * this proportion can be determined quickly in an entirely mechanical way" when using the new form of test. "Such a tabulation enables the teacher who wishes to review the questions most frequently missed to aim his instruction unerringly, after the papers have been scored. If the topics are of sufficient importance, he can reenter these questions in later tests. With the usual method of written quiz a question is seldom asked a second time; the pupils, knowing this, pay comparatively little attention to such reconsideration." (1)

(1) James, Benjamin B. op. cit. p. 212

the present is a very different thing from the past. It is a new world, and it is a new world. It is a world of new ideas, new feelings, new hopes, and new dreams. It is a world of new things, new people, and new places. It is a world of new opportunities, new challenges, and new adventures. It is a world of new possibilities, new potential, and new power. It is a world of new life, new love, and new light. It is a world of new hope, new faith, and new trust. It is a world of new joy, new peace, and new happiness. It is a world of new freedom, new justice, and new equality. It is a world of new unity, new harmony, and new brotherhood. It is a world of new love, new compassion, and new kindness. It is a world of new understanding, new wisdom, and new knowledge. It is a world of new truth, new beauty, and new goodness. It is a world of new life, new love, and new light. It is a world of new hope, new faith, and new trust. It is a world of new joy, new peace, and new happiness. It is a world of new freedom, new justice, and new equality. It is a world of new unity, new harmony, and new brotherhood. It is a world of new love, new compassion, and new kindness. It is a world of new understanding, new wisdom, and new knowledge. It is a world of new truth, new beauty, and new goodness.

Besides measuring the achievement of students, probably the most prominent function of the examination, Prof. Monroe (1) feels that it "also affords a unique type of opportunity for learning." The pupil gains new ideas as a result of the reflective thinking he does in answering the questions. "Under rather well defined conditions, certain tasks are set for the pupil and he is required to demonstrate within a limited time what he can do. He is thrown on his own resources and forced to work under pressure." While admitting that all pupils do not always learn in taking an examination, Prof. Monroe counters with the statement that all pupils do not take advantage of all other educational opportunities which are offered them, but as a preparation for an examination the pupil ordinarily reviews with a strong motive for retaining the matter reviewed. To meet the objection that cramming in order to pass an examination is undesirable, Prof. Monroe states that cramming is undesirable only when it has not been preceded by thoughtful study, and even in that case it is better to have the student cram for an examination than to go through the course without engaging in any learning. Cramming can be eliminated, however, by proper instruc-

(1) Monroe, W. S. Written Examinations and Their Improvement. op. cit. p. 211

tion which gives the proper weight to the record made during the course rather than basing the grade entirely on the final examination. So long as the examination consists of appropriate questions a pupil who studies to pass the examination will be directing his energies to appropriate ends.

This same idea is expressed by Russell (1) when he says, "Examinations must have a place in every scheme of instruction. Instruction can proceed only when the extent and quality of the learner's knowledge is definitely understood. Every recitation, every review is such an examination; further examinations of a formal sort are often desirable for the sake both of the teacher and of the pupil. But such examinations are given by the teachers within the school or school system and primarily for the purposes of instruction."

To motivate further learning. Not only do examinations measure efficiency of teaching and progress in learning but they furnish an effective motive for further learning. "In so far as possible the pupils should be motivated by the intrinsic values of the subject-matter. These values, however, are frequently remote from the

(1) Russell, James E. The Trend in American Education. American Book Company, 1922, pp. 58-59

life of a student and it is necessary to resort to motives which make a more immediate appeal." (1)

G. C. Myers expresses this idea aptly when he says, "Something in addition to merely appealing to the future motives seems necessary at times to urge along the average reader, some means whereby his future needs are made comparatively more immediate. Not merely does the examination stimulate the reader generally, but it also helps to determine his specific interest and behavior. If the child feels himself compelled to give an account of what comes within the field of his perception, he will soon develop a habit of attending to that for which he will probably be held accountable. The examination, when properly applied, constantly reminds the reader that he is responsible for the mastery of what is proposed for his learning." (2)

"The most favorable teaching opportunity that ever comes to a teacher," according to McCall, "is the period immediately following an examination. The pupils' interest to know what part of the examination he missed and what he got correct is then at white heat. Witness the interested discussion among

(1) Monroe, W. S. *Written Examinations and Their Improvement.* op. cit. p. 218

(2) Myers, G. C. *Examinations and the Learner.* Educational Review, vol. 54, 1917. p. 274

pupils immediately following an examination. It is an inexcusable neglect of an educational opportunity not to capitalize these precious moments for correcting erroneous ideas, clinching right ideas, and filling up mental spaces where ideas are not." (1) It is here that the new type examination excels because when properly administered it is corrected during the same period in which it is given, and the points of difficulty are discussed immediately. If, as Prof. McCall sates, "We really teach when we test," then the new type test, which can be given frequently because of the relatively small time in which it may be given and scored, is the best measuring device because it reveals to the pupils just where their difficulties lie, at a time when interest, which shortens the learning process, is aroused.

(1) McCall, W. A. A New Kind of School Examination.
Journal of Educational Research, vol. 1, 1920
p. 44

The Place of the Informal Objective Test

Relation between standardized and unstandardized tests.

As the name implies, a standard test is: (1)

1. An attempt to control or standardize the conditions of the examination period with respect to directions, time allowance, method of responding, etc.
2. Objective or impartial, that is, the personal equation of the examiner is minimized or eliminated,--minimized in the administration, and eliminated almost or quite completely in the scoring of the examination.
3. Standardized so as to provide norms by which the scores of individual pupils may be evaluated and interpreted in the light of facts. Such facts are the performance of large numbers of supposedly typical pupils on the same tasks.

In regard to the availability of standardized tests Monroe says, "Standardized educational tests have been shown to be superior to ordinary examination, but
* * * The number of satisfactory standardized tests is

(1) Ruch, G. M. op. cit. p. 22

The Value of the National Debt

1. The National Debt and the National Income

As the National Debt is a liability of the Government

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as yet very limited. In only a few school subjects, such as handwriting, spelling, arithmetic, and oral and silent reading, do we have available standardized educational tests which might be used as substitutes for the written examination. * * * Standardized tests are of necessity confined to those topics which are generally taught." * * * A teacher may wish "to measure the results of instruction given to a particular class." (1)

It is in this latter function that the informal objective test operates. As used here the informal objective tests "might well be termed unstandardized tests. They are, in many instances, * * * patterned after the standardized tests but lack the tempering obtained through the long processes of standardization. * * * They are as nearly objective as possible, that is, they are so constructed that the method of administering, scoring, and tabulating is identical with that provided for the standardized tests. They are usually constructed by teachers or supervisors for securing accurate measures of the achievement of pupils in a particular class. * * * No definite attempt is made to evaluate each element of the test * * * nor * * * to develop standards

(1) Monroe, W. S. Written Examinations and Their Improvement. op. cit. pp. 215-216

of achievement through giving them to a vast number of children in various places. The informal tests are usually constructed in response to a local situation and are limited in their use to the situations concerned. Obviously they do not possess all the virtues of the standardized tests and are limited in their application," (1) but they can be used effectively by teachers as a measure for the improvement of instruction, especially in many instances where no standardized tests are as yet available.

Informal objective tests may be used to supplement standardized tests which ordinarily come in one edition only and therefore soon become worthless as a means of instruction. In case it is not financially possible to secure standardized tests informal tests may be substituted. Practice exercises in remedial instruction can be based on the errors revealed by the informal tests about as well as on the results of standardized tests. Finally, they may be used to evaluate the results of educational experiments. "Out (of their use) is certain to come much improvement of instruction and a real interest in the professional and scientific aspects of teaching." (2)

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- (1) Woody, C. W. Informal Tests as a Means for the Improvement of Instruction. First Yearbook, Dept. of Elementary School Principals, N.E.A. 1922, p. 87
(2) Ibid p. 94

Limitations of the traditional examination. Two lines of experiment have shown that rating based on the traditional essay test is unworthy of serious consideration: (1)

"1. In several of the high school subjects test papers written by students have been rated by many teachers with not only no substantial agreement but incredible disagreement.

"2. Teachers who were suspicious of the worthwhileness of their ratings have rated sets of papers without putting any marks on them, have laid them away for some weeks or months, and then rerated them. The result has usually been that the two sets of ratings were not reasonably comparable."

The subjectivity of scoring indicated in these two lines of experimentation is increased if the number of papers is so great that they cannot be read at one sitting. It is inevitable that the attitude of the teacher change as a number of papers is read, either becoming more lenient as it appears that very few in the class have recorded the salient points, or becoming more drastic as the "mind-set" of the reader changes. It is impossible in the reading of a number of the typical tests to remember

(1) James, Benj. B. op. cit. p. 209

credit given previously or to prevent the attitude from being influenced by the writing or style of the paper. "Traditional examinations are so subjective," says McCall, "that it is well-nigh impossible for the teacher to prevent her judgment from being influenced by fluctuations in her disposition or being colored by her affection for the pupil whose paper she is scoring." (1)

Another limitation of the traditional examination is that its scope is necessarily narrow. "It is traditional for examinations to consist of ten questions. A few are limited to a smaller number and only occasionally do we find examinations consisting of more than ten questions. The pupils cannot write upon a large number of questions in the time allowed." (2) This sets a premium on the ability of the student to predict the questions which will be selected for examination. "When we were students," says McCall, "almost as much of our ingenuity went into divining the kind of question the teacher would ask, as into reviewing," (3) and we have no reason to suppose that students' methods

(1) McCall, W. A. op. cit. pp. 42-43

(2) Monroe, W. S. Written Examinations and Their Improvement. Historical Outlook, Nov. 1923, p. 309

(3) McCall, W. A. op. cit. p. 42

of study have changed.

It is frequently stated that the essay type of test gives the student "a taste of concentrated effort at logical thinking and at clear and connected expression." In answer to this Dadourian says, "Even a casual glance at examination papers shows that the great majority of students do not even attempt to think logically and to express their thoughts clearly during examination. On the contrary they endeavor to put on paper, in any shape whatsoever, as many as possible of the bits of knowledge which they have crammed into their memory and which are in the process of evaporating into thin air even during the course of the examination." (1)

Furthermore, according to a study of the different types of teachers' tests made by Ozanne, (2) the pupils themselves recognize the fact that it is easy to bluff on an essay test, that a vivid imagination and a good vocabulary will go a long way in passing a test, whereas those who do not write English well are at a disadvantage.

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- (1) Dadourian, H. M. Are Examinations worth the Price? School and Society, Vol 21, 1925, p. 442-443
(2) Ozanne, Charles E. A Study of Different Types of Teachers' Tests. School Review, Vol 24, 1926 p. 54-60

The advantages and disadvantages of the informal objective test. Opposition to the new type tests, as we have seen, criticizes the objective, short answer, new-type examination for measuring mere information, "the memorization of more or less unrelated facts," whereas they claim that the old type "involves the organization and integration of related and unrelated materials in the formulation of interpretations and judgments, thus yielding a direct measure of logical reasoning capacity." (1) In answer to this charge Professor Paterson quotes Ben D. Wood (2) in giving evidence that modern experimental psychologists admit a close correlation between thinking and information.

"Facts do not exist in the mind in isolation. We remember by thinking, and we think by remembering facts..... Every experimental study thus far made and reported has shown a very high relationship between measurement of information in a field and intelligence or ability to think in the material of that field."

In the same vein E. P. Kimball says, "Many opponents

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- (1) Paterson, D. G. Do Old and New Examinations Measure Different Functions? School and Society, vol. 24, 1926 p. 247
 - (2) Wood, Ben D. Measurement in Higher Education. World Book Company. pp. 162-163

of the new-type examination give the impression that reasoning and thought-building can go on without facts or definite data, that there is something dangerous about information. But there is little to fear from facts or details provided we learn how to utilize them and to winnow the significant from the insignificant." (1)

In an attempt to compare the essay type and new type test as to whether or not they measure the same thing, an interesting experiment was carried on by D. G. Laird in a class in Educational Psychology. (2) Upon the completion of the study of the glands, the class was unexpectedly called on to write an essay on The Adrenals in Psychology. They were given unlimited time and told to write everything they knew about them. After the essays were completed the students were given a list of twenty-eight new-type questions covering the ground as it had been presented in class. The essay examinations were checked over point by point to see how many of the twenty-eight topics had been included in the essay, and the two methods of

(1) Kimball, E. P. As for Examinations. School and Society, vol. 27, 1928 p. 572

(2) Laird, D. G. A Comparison of the Essay and the Objective Type of Examination. Journal of Educational Psychology, vol. 14, 1923 pp. 123-124

examining were compared by contrasting the number of points scored in the essay with the number of points scored on the same scale in the objective examination. It was found that correlation between the amount of information contained in the essay test and in the objective test was very low. Judged by the essay examination the students knew approximately half as much as on the objective type. It was therefore concluded that the sparse sampling of the essay test should not be taken as a true measure of the student's knowledge when other type tests showed that he knew twice as much about the subject as he had written.

A second basis of comparison was made of these same tests to determine the validity of the statement that the essay type of examination tested and developed "the previous mental ability of organization of materials." (1) The supposition was made that if this were true it might be expected that the more intelligent students would do better on the essay type than would the poorer students. It was found that the correlation between the results of the two tests in the case of the twenty-seven who were above the class average of intelligence, though

(1) Laird, D. G. op. cit. p. 124

small, was slightly higher than in the lower group. It was thus concluded that in the case of the more intelligent students the essay type of examination is fairer in showing how much they really know about the subject, than is the case with those of lower intelligence rating. This was thought to indicate that the essay test "becomes more of an intelligence test than an evaluation of the materials gleaned from the content of the course." (1)

In spite of this evidence McCall states that it is still "very difficult for some people to believe that such a test (objective) does anything more than give the highest score to the luckiest guesser." (2) To add to the preponderance of evidence to the contrary he gave four tests to a class in Educational Psychology,--the first was a true-false, the second was a traditional "What" and "Discuss," the third, a true-false, and the fourth, traditional. It was found that the half-dozen poorest and the half-dozen best remained in the same relative position as to scores obtained in both types of test.

Accepting the fact, then, that the objective and the essay test do measure the same mental capacities, the objective test is to be preferred because:

(1) Laird, D. G. op. cit. p. 124

(2) McCall, W. A. op. cit. p. 37

1. A much wider field of subject matter can be covered in an hour.

2. The pupil is more convinced that he gets the rating he deserves, at least the rating is the same for one as for another.

3. Less writing is called for, leaving more time for thought.

4. There is no chance to camouflage ignorance by pushing a "facile pencil."

5. Pupils enjoy this form of test more than the old form, "though the glib of tongue may fear it more."

6. The form of test "calls on the student for evidence of equipment in exactly the same way later life will call upon him. Is this statement true? Which of these causes, reasons, or facts is most nearly the true one? Rarely indeed will he be called upon to make a speech on any topic he has studied in school, or write an essay upon it; in case he is so called upon he will be given time to look it up." (1) In this new type of test the "Questions are presented in a life situation, with the important facts there for the reader to use." (2)

7. There is not so much strain or tension in the taking of the examination, since there is a minimum

(1) James, Benj. B. op. cit. p. 211

(2) Klise, N. M. Student Opinion of Types of Examinations. School and Society, vol. 24, 1926, p. 24

of writing and a wide range of points.

8. The grade obtained is fairer, since it indicates actual points earned, and not teacher estimates of the answer.

9. It makes possible the very necessary constant review. "Frequent examinations of this type tend to keep the students keyed up to the work assigned. They will also lead to better methods of study. The students study to understand and apply rather than to memorize for pure reproduction." (1)

It is significant, according to James, that "No teacher has abandoned it after once getting into the swing" of the new-type objective test. Therefore we conclude with Ruch and Stoddard that, "For examination of factual character, it seems a fair prediction to assert that the traditional examination will gradually give way to the informal objective examination and the standard test." (2)

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- (1) Batson, W. H. Reliability of the True-False Form of Examination. Educational Administration and Supervision. Vol. 10, 1924, p. 101
(2) Ruch and Stoddard. Tests and Measurements in High School Instruction. World Book Company, p. 252

The Building of Objective Tests

From the standpoint of the teacher one of the chief obstacles to the adoption of modern methods in testing comes from the quite "universal habit of spending little time in preparing questions and much time in scoring papers * * * These amounts of time should be reversed. * * * Preparing good questions is a difficult and slow process; scoring papers should be easy and rapid." A really good question is an inspiration and the preparation of some fifty-odd questions "is a task that taxes the ingenuity of the best teacher. Hence the necessity of studying the questions, carefully revising them after first use and preserving the best for future use." (1)

However, the teacher learns by doing. "It would be an error to wait until a * * * psychological background has been attained, the very point is that opportunity is provided for learning by doing." (2)

The type of test which is here employed comes under the classification of the new-type, non-standardized or informal objective test to measure

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- (1) James, Benj. B. op. cit. p. 212
(2) Herring, J. P. Educative Control by Means of a New-Type Measurement. Journal of Educational Method. Vol. 4, 1924. p. 95

achievement in a designated unit of work in high school economics. Consideration and effort have been expended in the building of this type of test, not only to fill a personal need, but because so far as it has been able to be determined, there exists no commercially available tests of high school grade dealing with this subject. The one known as the American Council Economic Test, though designed for use in both high school and college, cannot serve both interests equally, and after examination the writer concurs in Odell's opinion that "on the whole (it) will probably receive more use in the latter." (1) Moreover the test as given can be used only upon the completion of the work in Economics, whereas some means of measuring progress during the course is essential to the class-room teacher.

Because of the social character of the study of Economics and because of the desirability of allowing free discussion of principles and their application to present day affairs during the class hour, some definite objective means of measuring knowledge obtained is desired in order that the course may not degenerate into what Professor Dawson has been pleased to label, "Ventilation," which is defined as

(1) Odell, C. W. op. cit. p. 297

a process by which air is caused to circulate through empty spaces. "Ventilation will purify, but it will not build up reliable thought, and that is one of the purposes of education in the social studies." (1)

The new-type objective test seems best to serve this purpose, as opposed to the traditional essay type test, first, because of the limited sampling possible in the essay type test, and second, because of the doubtful character of the thoughtful analysis and individual organization of material in the answering of the essay questions. Although advocates of the essay test insist that it carries greater value in mental organization and reflective thinking, experience has shown that in reality, the discourses received are merely the rehashing and giving back of ideas already discussed during recitation periods. (2) It seems preferable to test with the new device which calls for exact terminology and individual mental analysis before the proper answer can be designated, so as to assure one of the primary objectives of the course, that the "student goes away with a fund of knowledge which is definite,

(1) Dawson, Edgar. The Social Studies in Grade XII. Historical Outlook, April 1926, p. 157

(2) Laird, D. G. op. cit. pp. 123-124

certain, and available." (1)

In the preparation of the new-type test it is advisable to draw up a definite plan indicating the importance of the several topics to be covered by the test and allotting a certain division to the major and minor topics. The items of the test may then be drawn up in preliminary form, avoiding trivial points and making sure that important points are adequately covered. A great saving of time may be effected by writing these preliminary test items on individual cards rather than listing them on a sheet of paper. These cards may be rearranged, discarded, or inserted without the necessity of rewriting in preparing the final form of the test. The statements are written on this preliminary card in the form best suited to the point in question, true-false, multiple-choice, completion, matching, etc., with no attempt at classification until the final sorting when all of the same type of statement are grouped together. On this card also the correct answer should be indicated as an aid in the preparation of the key. It is advisable to prepare from 25 per cent to 50 per cent more items than will be necessary in order that the less important, the too-easy, and the too-hard

(1) Taylor, F. M. Roundtable Discussion. Journal of Political Economy, December 1909.

may be discarded. The length of the test must be determined, of course, by the subject matter to be covered and not by any arbitrary standard.

In editing and selecting the items for final use the statements should be scrutinized to make sure that there can be no misunderstanding or ambiguity and to see that the sentence is properly constructed to allow only one possible correct answer. In arranging the items it is usual to group them in the order of their relative difficulty. To avoid waste of time on the part of the student taking the test and to provide better motivation and distribution of effort, the items are arranged from the easiest, which will be answered by all the class, to the most difficult, which will be failed by the majority of the class. When this arrangement has been made and there are enough items to permit alternate forms of the test, the cards may be dealt alternately into two piles, allowing the law of chance to equalize the difficulty of the two forms of the test.

The instructions for administering the test should be clear and as brief as clarity will allow, the amount of detail being dependent on the familiarity of the class with that type of test. One point

of credit should be given for each correct item in scoring the test. Attempts at weighting the items for difficulty or relative importance have been proved to be quite as likely to result in injustice as in justice. Under average conditions the teacher who scores from twenty to forty papers will not need to prepare an elaborate stencil as a key. A list of answers for reference will be sufficient as the answers are usually memorized as the result of scoring ten or a dozen tests.

The tests as prepared, then, are to be given upon the completion of the designated units in high school Economics in order to: (1)

1. Determine progress.
2. Prove the value or weakness of the selected material.
3. Reveal the stumbling blocks in the way of each child's success.

The affixing of the score is not to be considered the end but the results are to be diagnosed in order that points of difficulty--or results of poor teaching--may be analyzed and remedied. Where the subject matter of a unit is sufficient to warrant it, two sets of tests, such as given under Consumption, may be prepared. The

(1) Elston, B. op. cit. p. 304

second set may be used after a period of reteaching, or if that is found unnecessary, it is quite desirable that there be a second form available in order to care for the inevitable make-up examinations due to absence from class. Another use of the second set of examinations is that they may be alternated over a period of years. In this case it should be ascertained that the two forms have a high degree of correlation. Work along this line has still to be undertaken.

In the preparation of these tests an attempt has been made to follow procedures suggested by authorities in the field. Monroe's statement (1) that the true-false examination, when used alone, should include not fewer than fifty items, served as a guide for the length of the tests. Because each of the new-type exercises,--true-false, matching, multiple choice, and completion,--had its advocates, it seemed wise to break the test up into these types, including not less than fifty of the combined exercises in one test. This has been found to be of a convenient length for administering in the class period of forty-five minutes, allowing time for the correction of the items by the class, thus making provision for the law of learning which states that learning takes

(1) Monroe, W. S. Written Examinations and Their Improvement. Historical Outlook, Nov. 1923, p. 307

place under the best conditions when the results of learning are known,--the law of effect.

The true-false type of exercise is included because it gives "complete and timely information about the abilities and difficulties of the various pupils and about success and failures of teaching efforts." A record of the number of pupils missing a certain statement "will show what things have been well-learned or poorly learned, and well-taught or poorly taught." (1) "It is not only a splendid means of diagnosing weaknesses in study, but has permanent social value, for most of the interested statements of propagandists would never obtain the influence they do if men and women had even a partial habit of expecting some printed statements to be false." (2)

In the preparation of the true-false statements it was recognized that: (3)

1. The list should contain approximately the same number of true as of false statements.

2. Chance alone should determine what should be the order of the arrangement of the statements.

3. All ambiguous statements should be eliminated.

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- (1) McCall, W. A. op. cit. pp. 44-45
(2) Hardy, R. E. op. cit. p. 328
(3) Batson, W. H. op. cit. p. 96

4. Suggestive or leading statements should be avoided.

The multiple-choice form of test was included because, according to Waples, that form of test combines the definiteness and scope which are the distinctive features of the true-false and essay form of tests. "The true-false restricts the pupil's thinking to a choice between alternatives and is therefore entirely definite. The essay test imposes no restrictions whatever, within the limits of the topic and accordingly affords large scope for the pupil's responses. The best-answer test, while restricting the pupil's thinking to a central issue, allows him the choice of several possibilities. Thus it is a device well suited to the stimulation and direction of individual thinking." (1)

In the preparation of the multiple-choice items an effort was made to avoid:

1. Obviously wrong responses.
2. Lack of uniformity in form.
3. Placing the correct response in the same position.

The completion test is sometimes criticized because it stresses memory. In certain cases exact

(1) Waples, D. The Best Answer Exercise as a Teaching Device. Journal of Educational Research. Vol. 15, 1927. p. 10

terminology is to be desired. Ozanne in his experiment demonstrated that pupils realized that the completion test "cannot be evaded, * * * it gives no room for bluffing." (1) "Let us decry 'mere memory' as much as we like, the richer the associative memory, the more real the social or historical knowledge. What we decry is only meaningless or disassociated memorization; the whole value of the social sciences in daily living is that the present event calls up a complex network of memories." (2)

The matching or association test is included because not only is it purely objective but it may be used to measure either factual mastery or judgment. Chance successes may be avoided by using ten or more pairs, or by incomplete matchings, that is, having more definitions, for instance, than there are terms to be defined. (3)

In the preparation of all types of exercises an attempt was made to avoid the faults listed by Lee (4) among which are:

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- (1) Ozanne, C. E. op. cit. p. 59
 - (2) Hardy, R. E. op. cit. p. 327
 - (3) Ruch, G. M. op. cit. p. 276
 - (4) Lee, Baldwin. Some Faults Common to Informal Objective Tests Made by High School Teachers. Educational Administration and Supervision. Vol. 14, 1928, pp. 105-113

1. Poor wording
2. Ambiguity
3. Repetition of items
4. Involved phraseology
5. One statement answering another
6. Obvious answer
7. Unimportant and trivial items
8. Misspelling
9. Unnecessary modifiers
10. Specific determiners
 (The words almost, usually, nearly,
some, ordinarily indicate true state-
 ments; always, never, ordinarily
 indicate false statements.
 Degree or comparison clauses are
 usually true; cause or reason clauses
 are usually false.)

In submitting these tests it is done with a full knowledge of the "crudities and pitfalls" which are readily discernible, but in the absence of better instruments the class-room teacher is obliged to construct her own measurements. "'It takes three qualifications,' says West, 'to make a test, and they are not usually combined in one person, a statistician is needed, a psychologist, and a practical teacher.' A person who lacks one or two of these qualifications will make many blunders, but she may grow through making them into some measure of proficiency." (1)

With Weideman it is believed, "In any field the development of units of measurement is dependent upon careful investigation and upon a

(1) Elston, B. op. cit. p. 304

realization of the imperfection of the units already in use. The more imperfect the unit of measure which we now apply the greater the necessity for insisting upon measurement." (1) And finally, "It may be noted that measurements should be made for particular purposes. If there is no available standardized test which is suited to the purpose, it will be necessary to use an examination prepared by the teacher." (2)

(1) Weideman, C. C. op. cit. p. 8

(2) Monroe, W. S. Written Examination vs. Standardized Test. op. cit. p. 255

CONSUMPTION

True--False Test

1. ___ Consumption serves as one index to the progress of society.
2. ___ As a result of specialization every worker produces the commodities which he needs.
3. ___ Division of labor has increased the need for co-operation between specialists.
4. ___ Farming does not permit of minute division of labor because the processes must be carried on successively.
5. ___ Competition raises the prices of goods.
6. ___ Education reduces the cultural wants of man.
7. ___ Production is the creation of utilities in order to satisfy human wants.
8. ___ Air and sunlight are economic goods.
9. ___ Food and gasoline are examples of durable goods.
10. ___ Manufacturers create form utility.
11. ___ Wealth means money only.
12. ___ Consumption serves as a guide post to producers.
13. ___ Every addition to our supply of anything has less utility than the previous addition.
14. ___ Losses caused by fire and floods are justifiable because they make work for men.
15. ___ Demand means the desire for a commodity.
16. ___ It is an easy matter to differentiate between necessities, comforts, and luxuries.
17. ___ Demand for necessities is inelastic.
18. ___ As the income of a family increases the percentage spent for food decreases.
19. ___ Diminishing utility is the decrease in the ability of a good to satisfy our desire.
20. ___ A refrigerator at the North Pole has no value.

CONSUMPTION

Completion Test

1. Food, clothing, and shelter are known as man's _____ wants.
2. Air and sunlight are _____ goods.
3. A railroad adds _____ utility to fruit transported from Florida to Boston.
4. Marginal utility is the utility of the _____ important unit in the supply of a commodity.
5. A desire for an article constitutes a _____ when the desire is coupled with the ability to pay for the article.
6. Scarcity, human effort, and exchangeability are characteristics of _____ goods.
7. Every addition to our supply of one kind of good has less _____ than the previous addition.
8. Other things being equal, a fall in the price of an article will _____ the demand for the article.
9. The demand for necessities is _____.
10. Machinery and tools are _____ goods.
11. If one possesses a large supply of goods, the marginal utility of any one unit is _____ than if the supply were smaller.
12. The demand for luxuries is _____.
13. One of the factors which determines the standard of living is the _____ of money.
14. Goods are valued according to their _____ utility.
15. The extent to which changes in price are followed by changes in demand is known as _____ of demand.
16. Economic goods include wealth and _____.
17. The standard of living is _____ when prices rise.
18. Dividing the social income among the factors which produce it, is called _____.
19. The unnecessary things which the individual possesses are classed as _____.
20. There is _____ where each person in a factory has a certain task to perform.

CONSUMPTION

Matching Test

- | | |
|------------------------------------|--|
| 1. ____ Economic Goods | a. The study of the way man gets a living. |
| 2. ____ Utility | b. The destruction of utilities for the satisfaction of human wants. |
| 3. ____ Economics | c. The struggle among buyers and sellers to secure or dispose of their products on the best possible terms for themselves. |
| 4. ____ Wealth | d. Anything which can satisfy a human want. |
| 5. ____ Law of Diminishing Utility | e. Goods that are limited in quantity. |
| | f. Goods in the hands of the final user. |
| 6. ____ Consumer's Goods | g. The ability of a good to satisfy human wants. |
| 7. ____ Consumption | h. The utility a good possesses when it is in the shape desired by the consumer. |
| | i. Any useful, material thing that is owned by human beings. |
| 8. ____ Demand | j. At any given time the utility of any addition to the supply of a commodity decreases with every increase in the stock consumed. |
| 9. ____ Engel's Law | k. The desire for a commodity backed by the ability to pay for it. |
| 10. ____ Competition | l. As one's income increases, the percentage spent on necessities decreases. |

CONSUMPTION -- 2

True--False Test

1. ___ Consumption is the destruction of utilities for the satisfaction of human wants.
2. ___ Because of specialization individuals are no longer dependent on each other for the necessities and comforts of life.
3. ___ Manufacturing does not lend itself so readily to division of labor as does agriculture.
4. ___ Food, clothing, and shelter are man's primary wants.
5. ___ Goods consist of material commodities and personal services.
6. ___ Matches are free goods.
7. ___ Machinery, tools, and raw materials are consumers' goods.
8. ___ A factory building is an example of perishable goods.
9. ___ Flour used in the making of bread is productive consumption.
10. ___ Consumers' goods are those in the hands of the final user.
11. ___ Form utility is made available to man by miners, farmers, cattle raisers and lumbermen.
12. ___ A desire for a commodity becomes a demand when one enters the market ready to pay for it.
13. ___ Retailers create time and place utility.
14. ___ Marginal utility is the difference between the usefulness of the first and last unit of a commodity.
15. ___ Storage warehouses create time utility.
16. ___ Demand for luxuries is elastic.
17. ___ Consumption serves as an index to the progress of society.
18. ___ Every addition to our supply of anything has more utility than the previous addition.
19. ___ As the income of a family increases the percentage spent for necessities increases.
20. ___ Diminishing utility is the decrease in the ability of a good to satisfy our desire.

CONSUMPTION -- 2

Multiple-Choice Test

1. A suit of clothes worn by a person is

(a) producers' goods	(c) free goods
(b) consumers' goods	(d) durable goods
2. Free goods are

(a) Abundant	(c) Obtained without effort
(b) Without price	(d) Abundant and without price
3. Place utility is the utility a good possesses when

(a) in its natural state	(c) it is where it is to be used
(b) a change has been made in its form	(d) it can be had in quantities
4. The law of diminishing utility

(a) refers to consumers' goods	(c) relates to the varying satisfactions derived from identical elements
(b) relates to the last utility of a good	(d) refers to Engel's law
5. The using up of utilities for the satisfaction of human wants is called

(a) Consumption	(c) Economic Rent
(b) Distribution	(d) Price fixing
6. The creation of utilities for the satisfaction of human wants is

(a) Consumption	(c) Production
(b) Marginal Utility	(d) Law of satiety
7. A pleasure car is

(a) Capital	(c) Medium of Exchange
(b) Consumers' goods	(d) Wasteful
8. Mental effort in the creation of utilities is known as

(a) Services	(c) Labor
(b) Capital	(d) Goods
9. One reason competition is wasteful is

(a) it drives the inefficient out of business	(c) it necessitates duplication of equipment
(b) it furnishes an impetus to invention	(d) it utilizes by-products
10. Marginal utility of a commodity is

(a) the usefulness of the first unit in a series	(c) Buying on margin
(b) the usefulness of the least important unit in a series	(d) Difference between the usefulness of the first and last unit

CONSUMPTION--2

Matching Test

- | | |
|------------------------------|--|
| 1. ____ Economic Law | a. The creation of utilities to satisfy human wants. |
| 2. ____ Marginal utility | b. The dividing up of the wealth produced among the various groups that helped produce it. |
| 3. ____ Specialization | c. The utility a good acquires when it is present at a time convenient to the consumer. |
| 4. ____ Distribution | d. The utility which a good acquires when it is transported to the place desired by the user. |
| 5. ____ Place utility | e. The amount of necessities, comforts and luxuries to which one is accustomed. |
| 6. ____ Elasticity of Demand | f. "In the long run, lavish expenditure for luxuries is beneficial to laborers because it increases the demand for labor." |
| 7. ____ Standard of Living | g. The usefulness of the least important identical unit of a series. |
| 8. ____ Exchange | h. The differentiation of one occupation from another. |
| 9. ____ Make-Work Fallacy | i. The extent to which changes in price are followed by changes in demand. |
| 10. ____ Time utility | j. A statement of the tendency of a given economic cause to produce a certain economic result. |
| | k. The transfer of goods and services for other goods and services. |
| | l. Goods that may be obtained without effort on our part. |

PRODUCTION

True-False Test

1. ___ Land in Economics includes the ocean.
2. ___ The productivity of less favored pieces of farm land cannot be increased.
3. ___ Production is the destruction of utilities in order to satisfy human wants.
4. ___ Better means of transportation increases the amount of new land.
5. ___ The law of diminishing returns does not apply to land.
6. ___ The value of urban land is determined by its fertility.
7. ___ Capital is formed by using up all the economic goods which are produced.
8. ___ A pleasure car is capital.
9. ___ Unsuccessful inventive effort is labor.
10. ___ The crop of a farmer increases indefinitely in proportion to the number of employees he uses.
11. ___ Capital is money which has been saved.
12. ___ Coal consumed in a factory represents circulating capital.
13. ___ Localization of industries means the same as territorial division of labor.
14. ___ Large-scale production is always the most efficient form of business organization.
15. ___ An extensive system of transportation is necessary to our present large-scale system of production.
16. ___ All corporations are large scale producers.
17. ___ A corporation can usually raise more capital than a partnership.
18. ___ The Industrial Revolution was a sudden change in methods of production.
19. ___ The Post Office is an example of Government-owned business.
20. ___ Labor as a factor of production does not include mental effort.

PRODUCTION

Completion Test

1. The value of _____ land depends on fertility.
2. When steel is converted into an automobile the process is called _____.
3. A bondholder is a _____ of a corporation.
4. _____ value is the value stated on the face of the share of stock.
5. The theory of the growth of population was first stated by _____.
6. Division of labor was brought about by the _____ system.
7. Large-scale production is characterized by the concentration of _____.
8. New inventions tend to _____ the operation of the law of diminishing returns in farming.
9. The A. and P. stores are an example of _____ combinations.
10. In order to permit of minute division of labor, the various processes must be so arranged that they can be carried on _____.
11. Advertising and installment buying are modern methods of _____ the market.
12. Production is the _____ of utilities in order to satisfy human wants.
13. A stock certificate is evidence of _____ in a corporation.
14. In the extractive industries _____ is the dominant factor of production.
15. The _____ system was a result of the Industrial Revolution.
16. Location is a determining factor in the value of _____ land.
17. Interest on _____ stock is paid before interest is paid on _____ stock.
18. In the hand-made industries _____ is the dominant factor of production.
19. The _____ value of a stock is found by dividing the net worth of a corporation by the number of shares issued.
20. The extractive industries operate under _____ cost per unit.

PRODUCTION

Matching Test

- | | |
|---------------------------------------|---|
| 1. ____ Factors of production | a. Innumerable processes of production carried out over a long period of time. |
| 2. ____ Capital | b. A form of business organization in which the workers combine to secure, organize and control the factors of production. |
| 3. ____ Malthusian Theory | c. Land, Labor and Capital. |
| | d. One who secures, organizes and controls the factors of production. |
| 4. ____ Roundabout Production | e. The owning of all or most of the facilities necessary for the production of a commodity from beginning to end. |
| 5. ____ Dividend | f. Wealth used in the production of more wealth. |
| 6. ____ Labor | g. Population normally increases more rapidly than nature's ability to produce food for the increased population. |
| 7. ____ Technological
Unemployment | h. When any two factors of production remain constant, a point is finally reached where additional applications of the third factor will not yield proportionate returns. |
| 8. ____ Entrepreneur | i. All human effort used in the creation of utilities in goods. |
| 9. ____ Co-operative Business | j. Proportion of profits of a corporation distributed among the stockholders. |
| 10. ____ Vertical Combination | k. Being out of work because of the use of new inventions. |
| | l. Goods which can be used in but a single process of production. |

PRODUCTION

Multiple-Choice Test

1. The laborer is at a disadvantage in bargaining because
 - (1) labor cannot be stored
 - (2) of varying degrees of intelligence
 - (3) labor can be performed anywhere
 - (4) of migration
2. Capital is produced by
 - (1) Saving
 - (2) Using consumers' goods
 - (3) Using the wealth created by production
 - (4) Saving and investing
3. An example of a productive worker is
 - (1) a stock broker
 - (2) a gambler
 - (3) a wealthy man who spends his inheritance freely
 - (4) a bootlegger
4. Land, in economics means
 - (1) the dry land
 - (2) the materials and productive powers in the land
 - (3) the land and the materials and productive powers in the land
 - (4) the climate
5. The quantity of a good produced is dependent on
 - (1) size of the factory
 - (2) amount of capital
 - (3) supply and demand
 - (4) cost of production
6. Territorial division of labor is possible because of
 - (1) abundant labor
 - (2) temperate climate
 - (3) available capital
 - (4) good transportation system
7. One disadvantage of division of labor is
 - (1) the quality of labor is improved
 - (2) Capital is utilized economically
 - (3) the work is monotonous
 - (4) inventive genius is encouraged
8. Monopolists control prices
 - (1) by controlling supply
 - (2) by controlling demand
 - (3) by charging low prices
 - (4) by hedging
9. Consumers' co-operative business units have not progressed in the United States because
 - (1) they are expensive
 - (2) profits are divided at the end of the year
 - (3) Americans are too careless to bother about small savings
 - (4) they are too complex
10. The Industrial Revolution was characterized by
 - (1) great bloodshed
 - (2) new inventions
 - (3) family self-sufficiency
 - (4) increased attention to agriculture

EXCHANGE

True-False Test

1. ____ If the marginal utility of the commodity is less than that of the selling price, a sale will take place.
2. ____ There is a dollar's worth of silver in a silver dollar.
3. ____ Price varies directly with the demand for a commodity.
4. ____ A middleman adds no utility to goods.
5. ____ The selling price tends to equal the cost of production of the least efficient producer.
6. ____ Unmined coal is a part of the market supply.
7. ____ When a large-scale producer enters the stage of decreasing costs per unit, he begins to lose money.
8. ____ The grocer is a middleman.
9. ____ Market price tends to equalize supply and demand.
10. ____ The marginal producer is the last one affected by a change in the selling price of a commodity.
11. ____ Competition makes men more efficient.
12. ____ Normal price is that price which covers the cost of production plus a reasonable profit.
13. ____ Market price of the stock of a corporation is always higher than the par value.
14. ____ The quantity demanded varies inversely with the price.
15. ____ The functions of a middleman can be eliminated.
16. ____ There is no limit on monopoly price.
17. ____ There is free coinage of gold in the United States.
18. ____ The principal danger in connection with the use of fiat money is that there may be an over-issue of it.
19. ____ Creditors benefit by a rise in price level.
20. ____ Business depressions occur in the United States because of the political party in power.

EXCHANGE

Completion Test

1. Utility, scarcity, and exchangeability are the earmarks of _____ in the economic sense.
2. Normal price covers the cost of production of the _____ efficient producer.
3. The price of a rare old painting is high because of _____.
4. An increase in the demand for a commodity _____ its price.
5. The amount of goods that we can purchase with our money is called its _____.
6. When the government makes no charge for coining money it is called _____ coinage.
7. The Currency Act of 1900 provided that the currency of the United States was to be maintained on the _____.
8. The use of two or more kinds of money with legal tender power is known as _____.
9. Debtors benefit by a _____ in the price level.
10. _____ banks lend money on business paper.
11. An increase in price _____ the demand for a commodity.
12. The Federal Reserve Bank lends money to its member banks by _____ commercial paper.
13. The only commodity whose price is fixed by the United States Government is _____.
14. In manufacturing an increase in production tends to _____ the cost per unit.
15. An increase in price _____ the supply of a commodity.
16. Bondholders are _____ of the corporation.
17. Market price is that which will _____ the market.
18. Five-cent and one-cent pieces are called _____ money.
19. A decrease in the supply of a commodity _____ its price.
20. Depreciation in the value of money results in a(n) _____ in general prices.

EXCHANGE

Matching Test

- | | |
|--------------------------|--|
| 1. ____ Middleman | a. Value expressed in terms of money |
| 2. ____ Value | b. The process of collecting goods from producers located over wide areas and shipping and distributing them to consumer's located at other points throughout the same or other areas. |
| 3. ____ Market | c. Medium of exchange. |
| | d. That control over the supply of a commodity that enables the producer to fix the selling price. |
| 4. ____ Market price | e. Power in exchange. |
| 5. ____ Price | f. Where offers to buy and offers to sell come together. |
| 6. ____ Marketing | g. The long-time price around which market prices fluctuate. |
| 7. ____ Gresham's Law | h. One who buys and sells goods without changing their form. |
| 8. ____ Money | i. The price at which the supply equals the demand. |
| 9. ____ Monopoly | j. One which receives for safekeeping deposits on which interest is paid. |
| 10. ____ Commercial Bank | k. When two or more kinds of money circulate at the same time, the cheaper will tend to drive the dearer out of circulation. |
| | l. One which receives deposits against which checks are drawn. |

EXCHANGE

Multiple-Choice

1. Other things being equal an increase in the quantity of money in circulation
 - (1) results in an increase in prices
 - (2) Raises the value of money
 - (3) lowers prices
 - (4) has no effect on prices
2. A favorable balance of trade means
 - (1) An excess of imports over exports
 - (2) An excess of exports over imports
 - (3) that the country lost gold
 - (4) that times are prosperous
3. One disadvantage of the National Banking System is that
 - (1) it lacked elasticity
 - (2) it gave the country a uniform system of bank notes
 - (3) it established sound banking policies
 - (4) it provided inflation
4. The Federal Reserve Bank provides for elastic currency
 - (1) by not issuing money
 - (2) by decentralizing the control of banking
 - (3) by delaying bank collections
 - (4) by rediscounting commercial paper
5. One disadvantage of free trade is
 - (1) it develops infant industries
 - (2) it makes a nation dependent on others
 - (3) it prevents "dumping"
 - (4) it assures the economic independence of a nation
6. Greenbacks are accepted at par value because
 - (1) there is dollar for dollar reserve for them
 - (2) there is faith in the U. S. Government
 - (3) they are issued by the Federal Reserve Banks
 - (4) Gold is hoarded
7. When a monetary system is based on the use of one metal as standard money it is known as
 - (1) Monometallism
 - (2) Free coinage
 - (3) Bimetallism
 - (4) Seigniorage
8. The market price of a stock is determined by
 - (1) The number of shares issued
 - (2) Supply and demand
 - (3) The face value of the stock
 - (4) Treasury stock
9. Other things being equal an increase in price
 - (1) increases the supply of a commodity
 - (2) decreases the supply of a commodity
 - (3) does not affect the supply
 - (4) increases the demand
10. Other things being equal a decrease in price
 - (1) raises the demand for a commodity
 - (2) lowers the demand for a commodity
 - (3) makes no difference in the demand for a product
 - (4) is harmful to the consumer

DISTRIBUTION

True-False Test

1. ___ Distribution of the social income is divided equally among the factors of production.
2. ___ If a country pays its workers low wages it can therefore undersell a country paying higher wages.
3. ___ Economic rent refers to the return paid for the use of a natural agent only.
4. ___ The entrepreneur anticipates the needs of the public.
5. ___ It is easy to move labor from one locality to another.
6. ___ Labor groups tend to perpetuate themselves.
7. ___ Producers are willing to pay interest for the use of capital because capital is productive.
8. ___ An increase in the supply of money will result in an increase in the supply of capital with low interest rates.
9. ___ Public expenditures have decreased in recent years.
10. ___ High rent is the cause of high prices.
11. ___ The value of land is determined by capitalizing the income received from it.
12. ___ A small storekeeper on a side street can undersell the store on a main street because his rent is much lower.
13. ___ The real wages is determined by the relation between the nominal wage and the prices of commodities.
14. ___ Rent arises because of the differences which exist in the productivity of natural agents.
15. ___ All enterprisers in the same kind of business receive the same profit.
16. ___ High profits are the cause of high prices.
17. ___ Monopoly profits are the result of the control of the supply of a commodity.
18. ___ New inventions and new methods of production have no effect on competition.
19. ___ People having no children do not contribute to the public school tax.
20. ___ An import duty is an excise tax.

DISTRIBUTION

Completion Test

1. The return received by labor is called _____.
2. The productivity of farm land is dependent upon the _____ of the land.
3. The contribution paid to the owner of a natural resource for its use in production is known as _____.
4. The wages in a particular group are determined by the productivity of the _____ laborer.
5. Rent is _____ income because the one who receives it did not produce the land or other natural resources for which he charges rent.
6. As poorer land is brought under cultivation the economic rent of the more fertile land _____.
7. Wages tend to be _____ in a new country than in an old country.
8. _____ arises because all land is not equally desirable and freely available.
9. The return received by _____ is called interest.
10. If the entrepreneur's cost of production is _____ than the selling price he makes a profit.
11. Immigration restriction _____ money wages of unskilled labor.
12. Competition _____ profits.
13. The entrepreneur is entitled to a profit because of the _____ which he has assumed.
14. The payment for recording a deed or mortgage is called a _____.
15. "Residual share" is the term which economists sometimes use for _____.
16. The greater the risk the _____ will be the rate of interest.
17. There is no _____ between an individual in one group of laborers and an individual in another group.
18. The rate of interest paid on U. S. Treasury certificates is practically _____ interest.
19. A poll tax is a _____ tax.
20. An inheritance tax _____ be shifted.

DISTRIBUTION

Matching Test

- | | |
|-------------------------------|---|
| 1. _____ Distribution | a. Refraining from all business dealings with the employer. |
| 2. _____ Rent | b. An increase in the tax rate as the amount to be taxed increases. |
| 3. _____ Real wages | c. The amount of money that a laborer receives for his labor. |
| 4. _____ Usury | d. The division of the wealth produced, among the factors of production. |
| 5. _____ Profits | e. The compensation paid to the owner of a natural agent for its use in production. |
| 6. _____ Public Finance | f. Compulsory payments exacted by the government for the purpose of meeting governmental expenses. |
| | g. The purchasing power of the wages received. |
| 7. _____ Tax | h. That portion of the product of business activity which remains after returns have been made for land, labor and capital. |
| 8. _____ Progressive Taxation | i. That branch of Economics which deals with the raising and spending of the money needed by the government. |
| 9. _____ General Property Tax | j. A charge made by the government because it has rendered some specific service to the payer. |
| 10. _____ Boycott | k. A tax levied on all property, real and personal, on a uniform basis of assessment and at a uniform rate. |
| | l. The term applied to a rate of interest that exceeds the legal rate. |

DISTRIBUTION

Multiple Choice

1. The dividing up of the income of the wealth produced among the factors of production is called

(1) Production	(3) Exchange
(2) Social Income	(4) Distribution
2. Prices are higher in Boylston Street shops because

(1) rents are higher	(3) more people pass those shops
(2) moneyed people prefer to shop on that street	(4) of competition
3. The distinction between economic rent and earned income disappears in modern economics because

(1) most of the present owners of land have paid current prices for it	(3) the owner has done nothing to create economic rent
(2) of the Single Tax	(4) rent is the result of high prices
4. Capitalizing the income from land is

(1) an expense to the owner	(3) the excess income received
(2) finding the value of the land by dividing the income by the prevailing rate of interest	(4) putting the rent in the bank
5. Wages are higher in a new country than in an old, because

(1) it is densely populated	(3) the supply of labor is less than the natural demand
(2) the supply of land is greater than the demand	(4) natural resources are scarce
6. One reason for legislation restricting immigration is

(1) to form strong unions	(3) to "soldier on the job"
(2) to reduce seasonal unemployment	(4) to maintain high wages of laborers
7. One of the factors which determines the interest rate is

(1) the marginal producer	(3) the discount theory
(2) the element of risk	(4) the desire for power
8. The entrepreneur is entitled to a profit because

(1) he is entitled to salary for his work	(3) he takes no risk
(2) of poor business judgment	(4) he combines the factors of production efficiently
9. An income tax is one that is levied

(1) on salary	(3) on personal property
(2) on investments	(4) on annual income
10. If an entrepreneur owns his own land, uses his own capital, and manages his own business

(1) the entire return from his business represents profits	(3) each factor is responsible for a share of the returns
(2) the return represents rent	(4) the return represents interest

KEY

Test #1

CONSUMPTION

<u>True-False</u>	<u>Completion</u>	<u>Matching</u>
1. True	primary	1. e
2. False	free	2. f
3. True	place	3. a
4. True	least	4. i
5. False	demand	5. j
6. False	economic	6. g
7. True	utility	7. b
8. False	increase	8. k
9. False	inelastic	9. l
10. True	producers'	10. c
11. False	less	
12. True	elastic	
13. True	purchasing power	
14. False	marginal	
15. False	elasticity	
16. False	services	
17. True	lowered	
18. True	Distribution	
19. True	luxuries	
20. True	specialization	

KEY

Test #2

CONSUMPTION

<u>True-False</u>	<u>Multiple-Choice</u>	<u>Matching</u>
1. False	(b)	1. j
2. False	(d)	2. g
3. False	(c)	3. h
4. True	(c)	4. b
5. False	(a)	5. d
6. False	(c)	6. i
7. False	(b)	7. e
8. False	(c)	8. k
9. True	(c)	9. f
10. True	(b)	10. c
11. False		
12. True		
13. True		
14. False		
15. True		
16. True		
17. True		
18. False		
19. False		
20. True		

KEY
PRODUCTION

<u>True-False</u>	<u>Completion</u>	<u>Matching</u>
1. True	farm	1. c
2. False	production	2. f
3. False	creditor	3. g
4. True	Par	4. a
5. False	Malthus	5. j
6. False	factory	6. i
7. False	capital	7. k
8. False	delay	8. d
9. True	horizontal	9. b
10. False	simultaneously	10. e
11. False	extending	
12. True	creation	<u>Multiple-Choice</u>
13. True	ownership	1. (1)
14. False	land	2. (4)
15. True	factory	3. (1)
16. False	urban	4. (3)
17. True	preferred	5. (3)
18. False	common labor	6. (4)
19. True	book	7. (3)
20. False	increasing	8. (1)
		9. (3)
		10. (2)

KEY
EXCHANGE

<u>True-False</u>	<u>Completion</u>	<u>Matching</u>
1. False	wealth	1. h
2. False	least	2. e
3. True	scarcity	3. f
4. False	increase	4. i
5. True	purchasing power	5. a
6. False	gratuitous	6. b
7. False	gold standard	7. k
8. True	bimetallism	8. c
9. True	rise	9. d
10. False	Commercial	10. l
11. True	decreases	
12. True	rediscounting	<u>Multiple-Choice</u>
13. False	gold	1. (1)
14. True	decrease	2. (2)
15. False	increases	3. (1)
16. False	creditors	4. (4)
17. True	clear	5. (2)
18. True	token	6. (2)
19. False	increases	7. (1)
20. False	increase	8. (2)
		9. (1)
		10. (1)

KEY
DISTRIBUTION

<u>True-False</u>	<u>Completion</u>	<u>Matching</u>
1. False	wages	1. d
2. False	fertility	2. e
3. True	rent	3. g
4. True	marginal	4. l
5. False	unearned	5. h
6. True	increases	6. i
7. True	high	7. f
8. False	rent	8. b
9. False	capital	9. k
10. False	less	10. a
11. True	increases	
12. False	reduces	<u>Multiple-Choice</u>
13. True	risk	1. (4)
14. True	fee	2. (2)
15. False	profits	3. (1)
16. False	higher	4. (2)
17. True	competition	5. (3)
18. False	pure	6. (4)
19. False	direct	7. (2)
20. False	cannot	8. (4)
		9. (4)
		10. (3)

Errors made by individual pupils

True-False Test

Class No. 1

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	Score
Pupil																						
1																					0	20
2																					/	1 19
3																					/	1 19
4	/			/													/					3 17
5	/																	/				1 19
6	/																/					2 18
7	/					/															/	3 17
8															/							1 19
9	/			/						/		/										4 16
10														/								1 19
11	/			/						/		/										4 16
12										/				/								2 18
13	/			/																	/	3 17
14			/											/							/	3 17
15	/																					1 19
16				/		/								/								3 17
17	/						/															2 18
18	/																					1 19
19				/														/				2 18
20																						0 20
21							/					/							/	/		4 16
22														/			/					2 18
23	/																				/	2 18
24				/												/						2 18
25	/	/		/		/		/	/	/				/	/							9 11
26														/						/		2 18
27							/	/							/	/	/	/	/			5 15
28	/			/									/	/	/			/	/			6 14
29														/	/	/	/					3 17
30							/							/	/	/						3 17
31	/			/									/				/					4 16
32				/			/													/		3 17
33	/									/		/	/	/	/	/	/	/				8 12
34					/		/										/			/		4 16
35												/						/				2 18
Total	15	1	1	1	0	4	0	4	3	5	2	3	2	9	7	5	8	4	3	10	97	

Errors made by individual pupils

Completion Test

Class No. 1

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	Score
Pupil																						
1			/												/						2	18
2																	/	/			2	18
3																	/	/		/	3	17
4					/													/			1	19
5			/														/	/			3	17
6	/														/	/		/			4	16
7			/												/	/	/				3	17
8			/	/								/			/	/		/			6	14
9											/				/	/		/			3	17
10													/	/	/			/			4	16
11											/				/			/			3	17
12			/					/				/			/	/	/	/			6	14
13			/											/		/	/	/			5	15
14				/											/	/	/	/			5	15
15			/										/	/	/	/	/	/			7	13
16			/					/			/				/	/	/	/			7	13
17	/	/	/	/									/			/		/			7	13
18			/					/					/		/	/	/	/	/	/	9	11
19			/				/					/	/		/	/	/	/		/	8	12
20	/	/	/										/	/	/	/	/	/		/	10	10
21			/								/				/	/	/	/		/	6	14
22			/	/				/				/	/	/	/	/	/	/			10	10
23			/	/							/			/	/	/	/	/			7	13
24	/	/	/				/	/	/	/		/			/	/	/	/	/	/	11	9
25			/	/									/	/	/	/	/	/	/	/	10	10
26	/		/		/										/	/	/	/	/	/	3	17
27			/	/							/		/		/	/	/	/			8	12
28								/					/		/	/	/	/	/	/	8	12
29	/		/										/	/	/	/	/	/		/	8	12
30	/	/	/					/			/	/	/	/	/	/	/	/			10	10
31		/	/	/		/		/				/	/	/	/	/	/	/	/	/	11	9
32			/	/				/			/	/	/	/	/	/	/	/	/	/	11	9
33	/		/	/				/			/	/	/	/	/	/	/	/	/	/	12	8
34	/		/	/			/	/			/	/	/	/	/	/	/	/	/	/	11	9
35	/	/	/	/			/	/	/		/	/	/	/	/	/	/	/	/	/	13	7
Total	10	4	6	12	1	1	5	0	12	1	8	12	15	12	27	22	24	30	7	8	237	

Errors made by individual pupils

Matching Test

Class No. 1

Question	1	2	3	4	5	6	7	8	9	10	Total	Score
Pupil												
1											0	10
2											0	10
3											0	10
4											0	10
5											0	10
6											0	10
7											0	10
8											0	10
9											0	10
10											0	10
11	/										1	9
12											0	10
13											0	10
14						/					1	9
15	/										1	9
16											0	10
17	/										1	9
18											0	10
19							/				1	9
20						/					1	9
21	/										1	9
22											0	10
23	/	/		/							3	7
24											0	10
25	/										1	9
26	/										1	9
27				/	/		/		/		4	6
28		/					/				2	8
29						/					1	9
30	/				/	/					3	7
31	/	/			/						3	7
32				/				/			2	8
33	/			/							2	8
34											0	10
35	/	/					/		/	/	5	5
Total	11	4	0	4	3	4	4	1	2	1	34	

TOTAL SCORE

Class No. 1

<u>Pupil</u>	<u>True-False</u>	<u>Completion</u>	<u>Matching</u>	<u>Total</u>
1	20	18	10	48
2	19	18	10	47
3	19	17	10	46
4	17	19	10	46
5	19	17	10	46
6	19	16	10	45
7	18	16	10	44
8	17	17	10	44
9	19	14	10	43
10	16	17	10	43
11	16	17	9	42
12	18	14	10	42
13	17	15	10	42
14	17	15	9	41
15	19	13	9	41
16	17	13	10	40
17	18	13	9	40
18	19	11	10	40
19	18	12	9	39
20	20	10	9	39
21	16	14	9	39
22	18	10	10	38
23	18	13	7	38
24	18	9	10	37
25	18	10	9	37
26	11	17	9	37
27	18	12	6	36
28	15	12	8	35
29	14	12	9	35
30	17	10	7	34
31	17	9	7	33
32	16	9	8	33
33	17	8	8	33
34	12	9	10	31
35	16	7	5	28

Median 40

Errors made by individual pupils

True-False Test

Class No. 2

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	Score
Pupil																						
1															/						1	19
2															/						1	19
3				/											/						2	18
4															/						1	19
5																				/	1	19
6																					0	20
7	/															/	/				3	17
8				/		/															2	18
9				/											/						2	18
10				/																	1	19
11	/			/		/									/						4	16
12				/																	1	19
13	/			/		/															3	17
14				/											/					/	3	17
15																/	/	/		/	3	17
16				/											/						2	18
17				/											/						2	18
18				/											/						2	18
19															/					/	2	18
20				/								/									2	18
21			/	/			/								/					/	5	15
22				/											/	/					3	17
23				/																	1	19
24	/			/		/	/	/						/			/			/	7	13
25			/	/					/									/	/	/	5	15
26			/		/									/	/	/	/	/	/	/	9	11
27			/											/	/	/	/				5	15
28			/											/			/				3	17
29							/	/						/			/				4	16
30			/																		1	19
31														/							1	19
32			/	/										/			/				4	16
33			/						/					/			/		/		5	15
34			/	/			/								/	/					4	16
35	/		/				/					/	/		/	/	/			/	6	14
36			/	/	/		/					/	/		/						7	13
Total	5	0	3	23	4	4	3	4	1	2	0	2	1	2	23	7	9	3	3	9	108	

Errors made by individual pupils

Completion Test

Class No. 2

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	Score
Pupil																						
1																/	/				2	18
2			/											/		/		/			4	16
3						/	/		/												3	17
4			/										/			/				/	4	16
5			/								/					/	/				4	16
6			/			/					/			/		/	/				6	14
7			/					/				/					/				4	16
8			/											/							2	18
9								/					/		/	/	/	/			6	14
10	/		/										/			/	/	/			6	14
11											/			/		/		/			4	16
12	/		/									/		/	/	/		/			7	13
13	/													/	/	/	/				5	15
14									/			/	/	/	/	/	/	/			6	14
15			/									/			/	/	/	/			6	14
16			/				/							/	/	/	/	/		/	5	15
17							/	/	/				/	/	/	/	/	/			7	13
18	/		/					/				/	/	/	/	/	/	/			8	12
19											/		/	/	/	/	/	/			7	13
20	/		/									/	/	/	/	/	/	/			9	11
21			/	/								/	/	/	/	/	/	/			7	13
22	/		/	/				/					/			/		/			7	13
23			/				/	/	/			/		/	/	/	/				7	13
24			/												/	/	/	/			5	15
25			/				/	/			/	/			/	/		/			8	12
26			/												/					/	3	17
27			/									/	/	/	/	/	/				7	13
28											/		/	/	/	/	/	/		/	7	13
29			/	/				/				/	/	/	/	/	/	/			10	10
30	/						/	/	/			/	/	/	/	/	/	/			9	11
31			/				/	/	/			/	/	/	/	/	/	/			10	10
32								/			/	/	/	/	/	/	/	/		/	9	11
33	/		/					/	/			/	/	/	/	/	/	/			8	12
34	/						/	/	/			/	/	/	/	/	/	/			10	10
35							/	/	/		/	/			/	/	/	/			8	12
36	/		/	/			/	/	/			/	/		/	/	/	/			9	11
Total	10	0	23	4	0	2	7	7	12	1	7	13	19	19	24	30	23	23	0	5	229	

Errors made by individual pupils

Matching Test

Class No. 2

Question	1	2	3	4	5	6	7	8	9	10	Total	Score
Pupil												
1	/										1	9
2	/										1	9
3	/										1	9
4	/										1	9
5	/										1	9
6				/							1	9
7											0	10
8	/	/				/	/				4	6
9											0	10
10		/		/							2	8
11		/									1	9
12	/										1	9
13				/							1	9
14		/									1	9
15						/					1	9
16	/	/		/							3	7
17		/									1	9
18	/	/									2	8
19							/				1	9
20											0	10
21											0	10
22	/			/					/		3	7
23	/	/			/	/	/				5	5
24	/										1	9
25	/										1	9
26	/	/									2	8
27	/	/									2	8
28		/			/	/	/				4	6
29						/					1	9
30	/	/	/				/		/		5	5
31		/		/	/		/				4	6
32		/			/						2	8
33	/	/					/				3	7
34		/		/							2	8
35	/			/		/					3	7
36	/			/							2	8
Total	19	16	1	9	4	6	7	0	2	0	64	

TOTAL SCORE

Class No. 2

<u>Pupil</u>	<u>True-False</u>	<u>Completion</u>	<u>Matching</u>	<u>Total</u>
1	19	18	9	46
2	19	16	9	44
3	18	17	7	44
4	19	16	9	44
5	19	16	9	44
6	20	14	9	43
7	17	16	10	43
8	18	18	6	42
9	18	14	10	42
10	19	14	8	42
11	16	16	9	41
12	19	13	9	41
13	17	15	9	41
14	17	14	9	40
15	17	14	9	40
16	18	15	7	40
17	18	13	9	40
18	18	13	9	40
19	18	11	10	39
20	18	12	8	38
21	15	13	10	38
22	17	13	7	37
23	19	13	5	37
24	13	15	9	37
25	15	12	9	36
26	11	17	8	36
27	15	13	8	36
28	17	13	6	36
29	16	10	9	35
30	19	11	5	35
31	19	10	6	35
32	16	11	8	35
33	15	12	7	34
34	16	10	8	34
35	14	12	7	33
36	13	11	8	32

Median 39.5

Computation of Correlation Coefficient
between scores attained in Test #1 and I.Q.'s

Class No. 1

	Score in Objective Test	Rank	I.Q.	Rank	d	d ²
Pupil						
1	48	1	131	1	0	0
2	47	2	125	2	0	0
3	46	3	88	30	27	729
4	45	4	113	11	7	49
5	44	5.5	115	10	4.5	20.25
6	44	5.5	98	26	20.5	420.25
7	43	7.5	123	3	4.5	20.25
8	43	7.5	102	20	12.5	156.25
9	42	9.33	119	4	5.33	28.40
10	42	9.33	118	6	3.33	11.08
11	42	9.33	103	18	8.66	74.99
12	41	12.5	118	7	5.5	30.25
13	41	12.5	106	16	3.5	12.25
14	40	14.33	116	9	5.33	28.40
15	40	14.33	111	12	2.33	5.42
16	40	14.33	99	22	7.66	58.67
17	39	17.33	119	5	12.33	15.12
18	39	17.33	101	21	3.66	13.39
19	39	17.33	96	29	11.66	139.95
20	38	20.5	108	15	5.5	30.25
21	38	20.5	99	23	2.5	6.25
22	37	22.33	99	24	1.66	2.75
23	37	22.33	98	27	4.66	21.71
24	37	22.33	84	31	8.66	74.99
25	36	25	111	13	12	144
26	35	26.5	106	17	9.5	90.25
27	35	26.5	97	28	1.5	2.25
28	33	28.5	117	8	20.5	420.25
29	33	28.5	109	14	14.5	210.25
30	31	30	99	25	5	25
31	28	31	103	19	12	144
						<u>2986.87</u>

n = 31

$$\rho = 1 - \frac{6 \sum d^2}{n(n^2-1)}$$

$$\begin{array}{r} 1. \\ - .60 \\ \hline .40 \end{array}$$

Correlation Coefficient

$$29760 \overline{) 17921.22} \quad (.6025$$

Computation of Correlation Coefficient
between scores attained in Test #1 and I.Q.'s

Class No. 2

Pupil	Score in Objective Test	Rank	I.Q.	Rank	d	d ²
1	46	1	106	11	10	100
2	44	2.25	117	3	.75	.56
3	44	2.25	105	12	9.75	90.06
4	44	2.25	100	21	18.75	351.56
5	44	2.25	99	24	21.75	473.06
6	43	6.5	105	13	6.5	42.25
7	43	6.5	102	20	13.5	182.25
8	42	8.33	122	2	6.33	40.06
9	42	8.33	100	22	13.66	186.59
10	42	8.33	86	35	26.66	710.75
11	41	9.33	115	5	4.33	18.74
12	41	9.33	108	7	2.33	5.42
13	41	9.33	95	31	20.66	426.83
14	40	10.2	128	1	9.2	84.64
15	40	10.2	115	6	4.2	17.64
16	40	10.2	105	14	3.8	14.44
17	40	10.2	104	15	4.8	23.04
18	40	10.2	92	32	21.8	474.24
19	39	19	104	16	3.	9.
20	38	20.5	99	25	4.5	20.25
21	38	20.5	89	33	12.5	156.25
22	37	22.5	108	8	14.5	210.25
23	37	22.5	108	9	13.5	182.25
24	36	24.25	117	4	20.25	410.06
25	36	24.25	104	17	7.25	52.56
26	36	24.25	100	23	1.25	1.56
27	36	24.25	98	27	2.75	7.60
28	35	28.25	104	18	10.25	105.11
29	35	28.25	98	28	.25	.06
30	35	28.25	98	29	.75	.56
31	35	28.25	87	34	5.75	33.06
32	34	32.5	107	10	22.5	506.25
33	34	32.5	98	30	2.5	6.25
34	33	34	103	19	15.	225.
35	32	35	99	26	9.	81.
						<u>5299.20</u>

n = 35

$\frac{6}{42840)31795.20(} .7421$

$$r = 1 - \frac{6 \sum d^2}{n(n^2-1)}$$

1.
- .74
.26 Correlation Coefficient

SCATTER DIAGRAM

Correlation between scores attained in Test #1
and I. Q.'s---Combined classes

I.Q.	Scores in Test #1										
	27-28	29-30	31-32	33-34	35-36	37-38	39-40	41-42	43-44	45-46	47-48
128-131							/				/
124-127											/
120-123								/	/		
116-119				/	/		//	///	/		
112-115							/	/	/	/	
108-111				/	/	///	/	//			
104-107				/	///		///		//	/	
100-103	/			/	/		/	//	///		
96-99			//	/	////	////	//	/	//		
92-95							/				
88-91						/				/	
84-87					/	/		/			

Consideration of Results of Test No. 1

Test No. 1 on Consumption was given to two senior classes in High School Economics. Because of program arrangement and the closing of the marking period it was necessary to complete this section in three weeks. The unit tests, then, included an introduction to the study of Economics through a consideration of Consumption. This approach was chosen because, while the pupil may have only a vague idea of the process of Production, each one has had experience in consuming goods.

In administering the test each one was given a mimeographed copy of each of the sheets in the group and oral directions were given as to the procedure in recording the answer on each type of test.

In comparing the results it is interesting to note that the two classes, having the same teacher and presumably the same subject matter, differed on the questions on which the greater number failed. Such a test measures efficiency of teaching and brings out the fact that class discussion veers to a consideration of different points within the same subject matter.

Deficiencies in the preparation of the test are also brought to light, such as in question 10 of the Completion test. It was intended that the word, "producers'" be inserted, but the words, "durable" or "economic" could also be used correctly. According to McCall's rule for measuring efficiency of teaching,--the comparison of the median score with the total number of questions,--this test shows a teaching efficiency of 80 per cent.

In the scoring of the test one point was allowed for each correct answer. It was decided not to penalize the true-false test by scoring rights minus wrongs as studies have shown that final results have the same relative standing in either method of scoring, and when the test is used in combination with other type tests it is preferable simply to score the number right.

The scores attained in a test of this sort are quite distinct from the marks assigned. It is necessary to adapt the scores to the marking system in use. Monroe recommends that the median mark be assigned a grade which would represent one grade higher than the passing mark. Thus in a marking system with A, B, C, C-, and D, with C representing

the satisfactory passing mark, a grade of B should be assigned to those receiving the median, 40, and the other grades assigned on a proportionate scale. This method of marking, in this instance, correlates very closely with the marks obtained by converting the scores into per cents on a basis of 100. Following this method does not give a normal distribution curve, however. While all grades are represented, the curve skews toward the higher grades. This may be justified by the fact that the classes tested are of more than average ability, according to Monroe's standards, the median I.Q. being 106 and 104 respectively. Another justification for such a distribution is the fact that the course is given in the last semester of the senior year and the class therefore represents a selected group.

It is to be remembered that the grade attained on a test of this kind is not the only element in the term mark. Daily class work, special topics, and occasional case problems,--all are to be combined in arriving at the grade. To this total the objective test adds an additional measurement of recognized value.

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